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A Study on Governance of Labor Supply Modes, Factors and Efficiency in Bulgarian Farms

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Abstract

The goal of this article is to identify contemporary modes, factors and efficiency of labor supply in Bulgarian farms. Interdisciplinary New Institutional Economics methodology is incorporated and analysis made of new representative micro data collected from the managers of farms of different type and locations. The study found out that there has been enormous development in labor supply governance in Bulgarian farms during the last two decades. The permanent employment is major form for labor supply in farms, flowed by the seasonal and the part-time employments. Owners and family members accounts for the largest share of the total workforce. Different forms are used (high recurrence of contract between with same person, output-based compensation, use of service supply or inputs contracts, etc.) to reduce transaction costs of labor and overall governance of farms. The reasons for using employment contracts and importance of different labor supply and governance modes, intensity of transactions, types of partners, and kinds of remuneration varies considerably depending on juridical type, size, specialization, and locations of holdings. The most important problems in hiring labor are the lack of labor in the labor market, the high price of hired labor, requirement to pay social payments, pay-holidays, etc., big turnover of workers, high costs for adapting official labor standards, high costs for controlling of hired labor (cheating, stealing, etc.), high costs for negotiating conditions of employment, high costs to find good workers, low qualification of hired labor, advance age of hired labor, requirement for signing a written contract, and insufficient initiatives of workers. For a significant number of Bulgarian farms, the amount of costs for finding needed labor, and the amount of costs for managing the hired labor and workers in the farm are factors strongly restricting development of their enterprise. The

latter is particular important for a good proportion of major commercial farms like cooperatives, physical persons, and corporations, a to a lesser extent to sole traders.

Introduction

Analysis of the extent, modes and factors of division and cooperation of labor ("across the market and withing the firm") and "labor relations" (withing a firm, "class" conflicts, labor organizations, employment contracts) have been a major topic of economic science since its classical period up to the present days [1-6]. In the contemporary economics there are several "schools" for studying issues related to labor governance, contracts, and "combination" with other factors of production.

In the Neoclassical Economics, the market (price) competition is the only mechanism for governing relations between resources' (land, labor, capital, etc.) owners and farm entrepreneurs. The maximum efficiency is easily reached since property rights on resources are well defined, agents are fully rational, and exchanges costlessly governed. The farm is studied as a "production function" while efficiency of land, labor, etc. management is largely determined by technological parameters (selecting profitable products, exploration of economies of scale and scope withing a farm or another agrarian organization, etc.). In that "transaction costs free world" governance does not matter, and the most important management decision related to labor supply is to "make or buy" (products or services). The latter (market procurement or intra-farm integration) is easily calculated by comparing "production" costs reflecting market prices for employing (hiring) labor, purchasing (labor) services, buying inputs. etc. (Onofri et al., 2023) [7].

In the Agency Theory, the importance of agents' behavioral characteristics (opportunism, risk taking, etc.) and transaction costs of their relations is taken into account. Here the central issue related to labor supply is to design an "optimal contract" between labor provider (hired worker) and labor user (farm entrepreneur, farmland owner) [1,8,9]. Uncertainty in agriculture is high and it is not easily determined to what extent output variations are caused by natural conditions or labor contribution. Therefore, the "role of the employment contract", is to enable firms (in our case a farm) to share the risks for uncertain income streams as diverse employment arrangements (mainly compensation plans) are used to induce an employee to provide maximum ("optimal") efforts [6]. According to risk preferences and information asymmetry of the labor user either time (hour, day, season, etc.) based remuneration of hired labor, or output-based compensation of the principal (farm manager, land owner) and stimulate contribution of the agent (hired labor, tenant of land). Besides, the labor supply or land lease contracts are easily formally enforced ("promised" salary and rent always paid) since information is readily available to all parties, contracts not disputed and cheaply enforced by a third party (authority, court etc.).

However, this approach ignores the variety of alternative and efficient modes for governing relations between resource owners (partnerships, coalition in a firm or cooperative, permanent or

part-time employment, private ordering, informal agreements, interlinked and hybrid forms, informal modes), and significant transaction costs for contract enforcement during implementation stages. Furthermore, around the globe the employment contract is just one the form of the labor supply in agriculture. In many farms, the "own or family labor supply" is a major (non-contractual) form of governance due to high transaction costs for external trade of labor, land and other recourses (lack of skills, advance age, low demands, etc.).

The New Property Rights theory focuses on efficient distribution of property rights in the firm by creating ex-ante incentives for performance and innovation. The "core assets" supply of the firm such as highly specific human capital (manager, experts, etc.) are governed by providing ownership ("residual rights") while more universal assets by short or longer term (employment, service and/or inputs supply) contracts [10,11]. Investments in human capital are often firm-specific both for employer and hired labor and they will be lost if employment relations are broken. Since either partied might behave opportunistically regarding the division of surplus from firm-specific investments, diverse labor compensation schemes are used (e.g. wage rigidity instead of market fluctuations) to prevent the employee from quitting after investments are made[1] [6].

However, the major assumptions for "self-fulfillment of contracts" and the firm as "a nexus of contracts" does not correspond to the realty of modern (agrarian) economy. Since most contracts are "incomplete", diverse mechanisms for ex-post governance (credible commitment, control, trust) and other modes for governance are widely used such as relation (framework) contracts, trilateral modes, collective forms, public regulations (labor conditions, minimum salaries, working periods, social payments, etc.), informal modes and enforcements, etc. There are also various types of farms (individual, family, cooperative, corporative, hybrid) as distinct modes of governance and "something more" than a simple mix (nexus) of contracts [12,13].

The New Institutional Economics overcomes deficiency of other theories, making more realistic assumptions about "human nature" and taking into account personal characteristics of agents (ability, preferences, bounded rationality, tendency for opportunism, risk aversion, ideology, etc.), recognizing the critical role of the system of governance (formal and informal institutions, and market, contract, private, collective, public and hybrid modes of coordination and enforcement), and assessing overall (pre-contractual, post-contractual, and non-contractual) transaction costs in distribution (supply) of agrarian resources and activities in modern economy [2,14-17]. It identifies specific behavioral, institutional, economic, technological, natural, and transaction costs factors for governance choice, and assesses the comparative efficiency of alternative (practically possible) modes of governance in terms of minimizing overall (transaction and production) costs and maximizing the total (transaction and production) benefits of agents. For instance, it let explain

why in the post-communist transition with badly specified property rights, undeveloped markets, and poor public contract enforcement in Bulgaria, massive self-employment in subsistent and small-scale family holdings, and labor owned/managed agro-cooperatives and companies were among the most effective form for labor supply and farming organization [18].

This framework also helps understand the "logic" of emergence and evolution of diverse "new" forms of labor supply in the country such as partnerships and collective actions agreements, combine contract for labor and land supply, interlinking labor supply against services and/or marketing, hire labor or lease-out land to acquire the farm in the future, share payments of employees, employment of the farmer from an agent in vertical chain (processor, retailers, exporter, etc.), emergence of labor union, intermediaries, and professional organizations, public interventions (regulation, financial support, training, etc.) in labor-employer relations, etc. [5,19].

There are few comprehensive studies on dominating governance forms of labor supply in Bulgarian farms during EU integration and CAP implementation [5,20-23]. Publications in that area are mainly not representative, mostly based on official macro data (agricultural census, employment statistics), and focus on a particular type of labor (permanent, family), or type of employment (hired labor, full time), and formal modes (written forms,), and analyze only monetary (wages, salaries, social payments, etc.) rather than overall (monetary, nonmonetary, transaction, etc.) labor supply costs. All these studies give only a partial picture on the real labor supply forms in contemporary Bulgarian agriculture. For instance, there are still numerous reports about the huge informal sector of labor market, including in agriculture and rural regions [24,25]. According to some estimates workers in the gray economy in agricultural sectors are at least 40% [26].

The goal of this article is to identify actual modes and factors of labor supply in Bulgarian farms at current stage of development. This study is based on incorporation of interdisciplinary New Institutional Economics methodology (Coase, 2009) and analysis of new first-hand data collected from the managers of farms of different type and locations [13,27-31].

Methodology of Study

The New Institutional Economics recognize the importance of (formal and informal) institutions and the transaction costs for the governance choice (North, 1991) [31]. It puts individual transaction of the farm entrepreneur (in our case labor supply) in the center of analysis, identifies feasible modes of its governance (e.g. own supply, employment contract, partnership, etc.) in the specific institutional, market, technological and natural environment, and assesses their comparative efficiency in a discriminating (predominately transaction costs minimizing) way [31]. Typically, agents can choose between a range of alternative forms for governing a particular transaction, generic among them being the free market (e.g. stop-light purchase of labor service, daily or seasonal employment contract), a special contract mode (e.g. long-term contract for

service supply, permanent employment contract), and internal organization (e.g. own supply, partnership, etc.). Usually, the process of changing the system of agrarian governance is very slow [14]. Therefore, domination of certain modes of governance of particular agrarian activity and transactions means that they are the most efficient for participating agents[2] in the specific conditions of carrying farming activities and exchanges [27].

The institutional environment regulates to a great extent modern labor supply governance. For instance, unlike other resources, the ownership of human capital always stay with the owner (individual) and cannot be legally transferred – it is forbidden by law people to be sold and purchased[3]. The only legal forms of external labor supply are purchase of labor services and labor employment contract – the transfer of rights to use labor for certain activity or "services" for a particular period of time.

Also "labor relations" are strictly regulated and enforced by the public authorities in terms of conditions to use (quality, safety, etc. standards, "mandatory" breaks, holidays, use of immigrant and child labor, etc.), minimum wages and social payments, working period (maximum allowed hours per day, weak, etc.), interlinked services (e.g. free training, food, accommodation, transportation, etc.). In addition, labor force can be organized and protect their interests though collective actions and/or political power - e.g. professional associations, labor union, political parties, etc.

Unlike other inputs supply where the opportunism of the resource owner can take place before and during negotiating period, in labor service supply and employment contracts the opportunistic behavior is possible before and after contacting and during labor use[4]. The later require special mechanisms to "control" the opportunisms of hired labor, to induce cooperation and reduce transaction costs – directing, monitoring, evaluation, promotion, output-based compensation, payment of bonuses, interlinking with other benefits, participation in the farm management and/or ownership, etc. In addition, other mechanisms facilitating transactions and governing relations are also (even more) important like ideology (e.g. sustainable and green agriculture, etc.), family bonds, friendships, trusts, etc.

Finaly, due to specific characteristics of farming activities (needs for part-time hourly, daily, seasonal employment, huge area of production activities, etc.), the costs for outside control, regulation and dustup resolution are very high. The later is a major reason for existence of huge

informal labor supply sector and modes of governance with absence or subsistent labor safety standards, wage and/or social security payments, etc. [19].

In the specific socio-economic, institutional and natural environment, the choice of governance form principally depends on the agents' characteristics (preferences, capability, bounded rationality, opportunism, etc.)[5] and "critical dimensions" of transactions (such as frequency, uncertainty and assets specificity)[6]. For instance, when uncertainty and assets specificity of transactions are high, a special (contract or internal) mode of governance is needed to increase rationality and safeguard specific investments from possible opportunism. Repetition of transactions between the same agents reduces bounded rationality and opportunistic behavior, and justifies costs for a special governance ("regime of bilateral trade"). Universal transactions are more effectively governed by "invisible hand of market" (high competition, partner can be changed at low costs). A high uncertainty, occasional exchanges between parties, and relation specific investment increase transaction costs and can block otherwise mutually beneficial exchange (needs for a third party and public intervention in private transactions). Detailed adaptation and operationalization of the New Institutional Economics methodology into analysis of agrarian structures is presented by Bachev [12,19,27].

There is no available statistical and other data for comprehensive analysis of governance structures in Bulgarian agriculture and that requires collection of new micro-economic data about agents, critical dimensions, dominating modes, factors and costs of carrying out farming activities and transactions [12].

Main agents who govern agrarian transactions and activities are the managers of different type of farms – individual, family, cooperative, corporative etc. Nobody knows better than farm managers the status and conditions of resources, activities and relations, the actual reasons for managerial choices, practically used governing forms (for resource supply, marketing, etc.), specific and overall costs and benefits for the enterprise, key factors facilitating or restricting development of farms, etc. That is why this study is based on first hand data provided by the farm managers.

During November-December 2023 a large-scale survey was carried out with the managers of 345 commercial farms of different juridical type, size, product specialization, and ecological and geographical locations. Farmers were interviewed by the local experts of the National Avicultural Advisory Service and selected as typical for the relevant region of the country. Surveyed farms account for 0,26% of all farms in Bulgaria (MAF, 2023). Majority of studied farms (94,2%) are "Registered Agricultural Producers" comprising 0,5% of all registered agricultural producers in the

country (Agrarian Paper, 2023). The structure of interviewed farms approximately corresponds to the contemporary structure of Bulgarian farms.

The goal was to "translate" the basics New Institutional Economics categories (governance, bounded rationality, opportunism, transaction costs, institutional regulations and restrictions, etc.) to the everyday language of the managers in order to avoid any confusion and make a proper analysis. Both formal and informal arrangements, including interlinked, complex and hybrid modes are taken into account. All critical institutional, market, personal, technological, natural, etc. factors for governance choice are accounted for. Total institutionally and personally determined transaction costs are included into analysis (information, learning, precontractual, post-contractual, coalition management and development, etc.). The governance of agrarian transactions (labor supply included) is studied holistically since not only specific (direct) but the overall costs of the farm is taken into consideration[7].

The questionnaire used in this survey was updated version of an old questionnaire from a similar large-scale study carried out during pre-accession period to the EU in 2001. The latter gave extraordinary opportunity to compare the results from both studies and analyze the evolution of modes and factors of land supply governance in the last two decades (before and during EU CAP implementation).

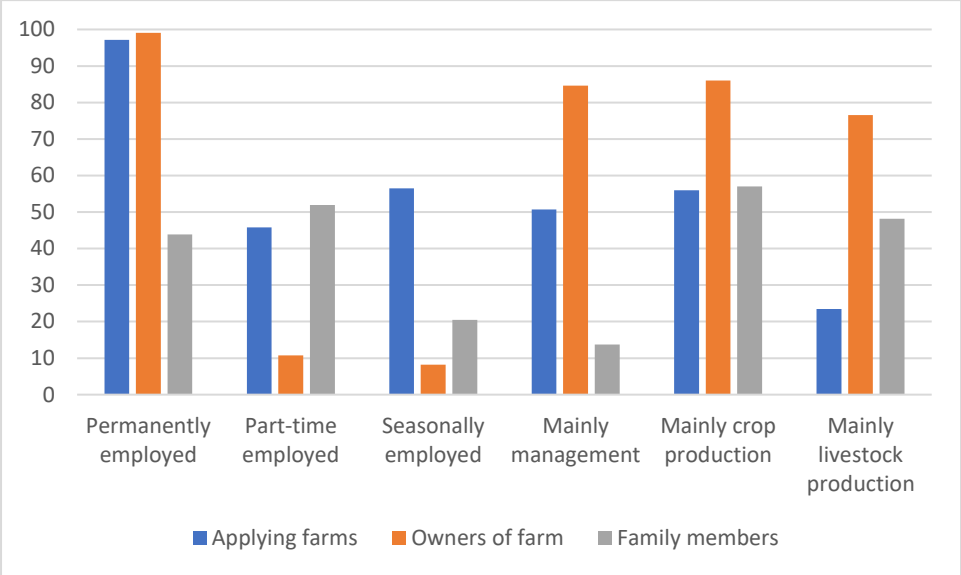
The responses of farm managers were summarized and grouped according to the farms' type and personal characteristics of managers. In addition, correlation between important indicators was determined (e.g. between gender, age, education, and professional experience of manager, and form of contract) in order to specify importance of certain factors on the type and costs of governance. For checking the survey representativeness, estimation of the statistical error is performed indicating discrepancy between the survey results and the whole population. The size of the statistical error is quite acceptable and therefore demonstrated survey facts and figures can be accepted with a high confidence and reliability for all Bulgarian farms[8]. Besides, similar results have been demonstrated with multiple in-depth case studies of different type of farms in recent years [32].

Type of Labor Supply

Permanent employment is a major form for labor supply in Bulgarian farms which is applied by almost all (97,1%) agricultural holdings in the country (Figure 1). What is more, permanently employed persons accounts for a little more than third of the total workforce employed by the Bulgarian farms (Figure 2). The majority of employed though this mode labor are predominately

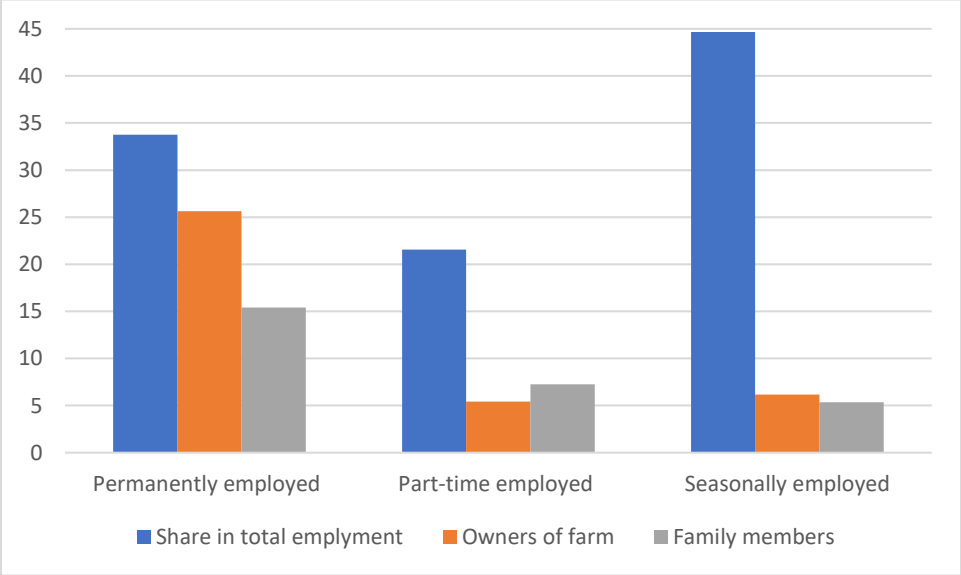
engaged in crop production (57,3%), while the remaining greatest portion (24,2%) in livestock production (Figure 3). Most of the labor used in the farm management are also involved through this form of employment.

Figure 1: Share of Farms Applying Different Forms of Employment in Bulgaria (Percent)



Source: interviews with farm managers

Figure 2: Number of Different Types of Employed Persons in Total Farm Workforce in Bulgaria (Percent)



Source: interviews with farm managers

Figure 3: Share of Labor Specialized in Management, and Crop and Livestock Productions in Total Workforce of Farms Employing Permanently, Part-Time and Seasonally in Bulgaria (Percent)

Source: interviews with farm managers

Governing of the farm activities and relations commonly requires full ("around the clock" and "throughout the year") involvement of the farm entrepreneur, farm owner or farm manager. Therefore, most farming enterprises in the country have at least one (The Farmer) full time or permanently employed in their operation and management.

The effecting execution of generally periodical and/or seasonal crop, livestock or mixed activity requires significant and constant farm specific time investments for specialized training, for: searching and processing (technologies, know how, market, formal regulations, etc.) information, for dealing with divers counterparts (negotiations with resource, inputs and service suppliers, buyers of farm produce), coordination of actions with coalition partners, and relations with interested parties, agrarian bureaucracies and other agents. For instance, specific knowledge of farm worker on quality, nutrition needs, pest, disease, wild animals and human (e.g. thefts, resource use or market competitors) risks of individual livestock, land plots and related biological and material assets (permanent crops, irrigation facilities and resources, etc.) are often highly specific to the particular farm investment and have to be effectively governed though a special internal mode [27]. Thus, effective undertaking and pay-back of such highly specific investments of the modern farmer (farm manager, farm enterprise) requires full time involvement and permanent employment in farming business. They are also one of the key features of the modern highly specialized and competitive "professional" farming system in the country and internationally.

Specialized investments in general and/or on-job training of workforce are particularly high for large farming enterprises hiring many family members or outside labor and their effective utilization

requires permanent full-time employment. Another economic reason for domination of this mode of employment in larger holdings is to save on repeated (transaction) costs for searching for good workers or service providers and daily or seasonal negotiations for hiring labor or service suppliers for needed for farm operations and activities. Very often the permanent employment contract is the most effective mode to supply (keep or secure) highly specific to the farm labor – a farm manager, a critical (for certain activity, particular time of delivery, etc.) specialists such as agronomist, veterinarian, operators of critical assets (combines for harvesting crop, special machineries and equipment, etc.), or low skill but needed farm labor in remote areas [27].

For certain type of farms (family, cooperative, etc.) permanent employment contract is the form to provide (create) jobs for family members and relatives, cooperative members and their families etc. In many cases, the full employment is the preferred modes since it is a preferred "favorite" job occupation for a particular person - farm manager, family member, farm labor, coalition partner, etc. Very often, the permanent employment is the only possible job opportunity for the farmer like in cases of widespread old-in age (retired from other businesses, etc.) or unqualified for other activities (low opportunity costs/income, temporary or constantly unemployed) self-employed farmers. Many of the later farms are less productive semi-market or predominantly subsistence holdings.

Another major mode of labor supply in Bulgarian farms is the part-time employment which is practiced by almost 46% of all holdings. Part-time employment accounts for almost 22% of the total workforce engaged in Bulgarian farms. A good proportion of employed though this mode labor are predominately engaged in crop production (60,1%), while a considerable fraction of the remaining part (23,4%) in livestock production. There are also certain labor involved predominately in farm management who are employed this way.

Some of the farm entrepreneurs have other major occupation and/or businesses and are only "partially" engaged in farming. Highly standardized and/or seasonal character of many agricultural activities make part-time farming feasible, and often economically viable and competitive. At the same time, work diversification in other related (agri-business) or unrelated (non-farming) activities of a farmer or his family members allows effective career development in other preferred areas, supplement household's income, facilitate funding and farming operations, reduce risk of income fluctuations, preserve family farms for post-retirement occupations and/or future generation, and enjoy farming as hobby or favorable (free-time or part-time) activity. The latter is particularly true for professional or non-professional one-person and family farming. Last but not least important, part-time farming is often determined by the periodical (seasonal) character of agricultural (mostly crop, and some livestock like bees) production make it difficult for new, unskilled or resourceless farmer(s) to generate sufficient and/or regular income throughout entire year.

However, there is another major economic reason for using a part-time employment in larger farming enterprises hiring outside labor. Part-time employment contract has a number of cost minimization advantages over permanent labor supply contract such as hiring according to real employment needs of farm, bigger flexibility, smaller overall remuneration, economizing on obligatory social payments via using informal (inwritten) form, not payments of "guaranteed" by Labor Law holidays (5 day working week, annual holidays), etc. Simultaneously, sighing a part-time employment contract with a particular labor minimize transaction costs saving repeated costs for finding good workers, constant (re)negotiation of contractual terms between same counterparts and secure labor in needed time, develop mutual knowledge, trust and "good" relations between partners, and restrict opportunistic behavior of both side (there exist a strong mutual interest to continue relations and save costs to change counterpart).

This mode is usually applied for supply of a regular but limited technological or administration highly specialized (e.g. accountancy, veterinary service, maintenance or repair of critical machinery, project applications, etc.) or well standardized labor (drivers, security guards, livestock feeders and cleaners, packaging, marketing, etc.) where contractual terms are easily specified and enforced. High frequency of transactions between same parties justifies (pay back) costs for negotiation, contracting and job training saving costs and avoiding likely risk from spotlight or regular purchase of services from specialized market when it is necessary. At the same time, labor market for such "services" is well developed and there is no high costs or risk for the farm to change suppliers – finding and using alternative worker is not associated with significant costs and time since no specialized investments are needed.

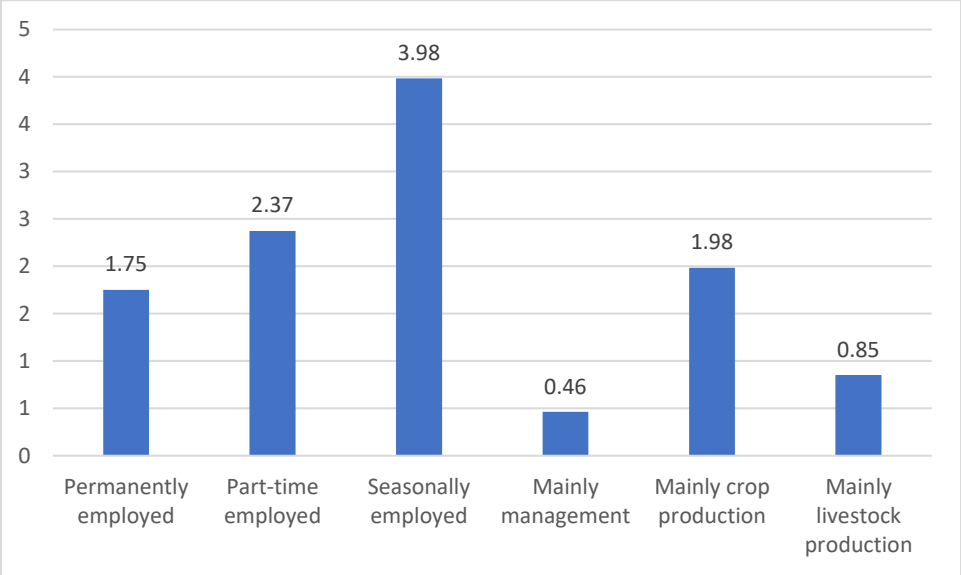
The second most popular form for labor supply in Bulgarian farms is seasonal employment used by almost 57% of holdings. What is more, this form of employment accounts for the biggest portion (around 45%) of the total workforce employed in Bulgarian farms. Two-third of employed though this mode labor are predominately engaged in crop production activities, while a good part of the remaining (22) in livestock production activities. Some labor predominately involved in farm management activities are also supplied through this form of employment.

Some important farming activities has "seasonal" character requiring significant amount of workforce in certain short periods of time - planning, vine and orchard pruning, harvesting, marketing, etc. That is often specialized, low skilled, routine, and non-specific for a particular farm labor which supply is easily governed by standard seasonal employment contracts. Here transaction and overall costs for finding, training, directing and controlling needed labor during widely known periods of farm operations are not significant. Instead of using daily or hourly (e.g. essential rose hand picking) service supply contracts a standard seasonal (harvesting, etc.) employment contract is used to save repeated costs between (frequently) same counterparts and secure labor supply during specific "critical" for the farm period (season). At the same time, there is no big risk involved

since labor market works well (seasonal and often well-paid (above average market rate) employment opportunity for certain groups like family members, students, retired persons, unemployed, ethnic minorities, immigrants) and finding alternative supplier is not associated with considerable costs (standards contractual terms, no farm specific investments required).

The number of employed persons in Bulgarian farms is not big and much lower than it is other sectors of economy. The average number of permanently employed persons in farms applying this mode of labor supply is 1,75 (Figure 4). In holdings employing part-time and seasonally labor the average numbers are 2,37 and 3.98 accordingly.

Figure 4: Average Number of Employed Persons in Bulgarian Farms



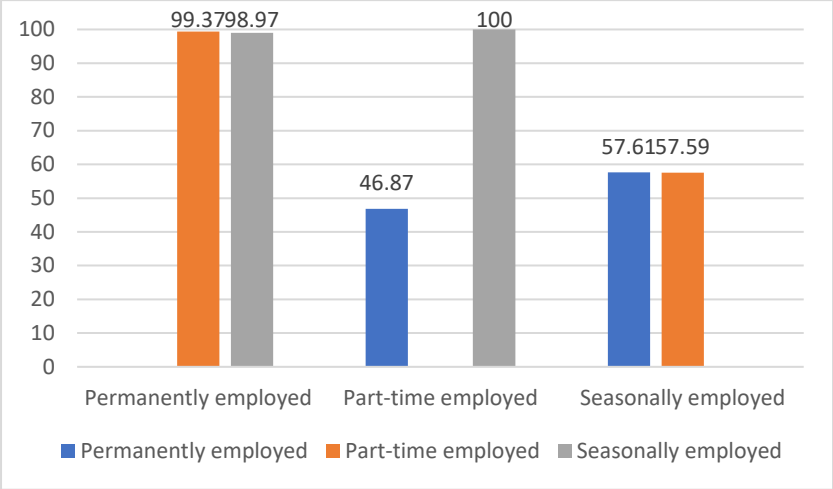
Source: interviews with farm managers

These figures give a new insight on the effective structure of labor supply in Bulgarian farms at current stage of development. They indicate that almost all farms use permanent employment mode as the most efficient mode of labor supply while part-time and seasonable employments are used by smaller proportions of holdings. At the same time, the average needs of country's farms from permanent workers are significantly smaller compared to the needs from part-time and seasonal labor – 35% and 127% accordingly for applying respective labor supply modes holdings. However, in the overall workforce permanent employment comprises 57% more than the part-time employment and around three quarters of seasonal employment.

Almost all farms using part-time employment and seasonal employment modes apply permanent employment (Figure 5). Therefore, permanent employment is the most important (critical) form for labor supply in Bulgarian farms. Significant proportion of holding using permanent employment also apply part-time employment to supply labor they need. In addition, all farms employing

seasonal workers apply part-time labor supply modes as well. Furthermore, a significant share (58%) of farms using permanent and part-time employment simultaneously apply seasonal supply of labor. Therefore, diverse employment modes are simultaneously used by country's farms to optimize labor supply according to their management capability and technological needs.

Figure 5: Share of Farms Applying Simultaneously Diverse Modes of Employment in Bulgaria (Percent)



Source: interviews with farm managers

The farms' labor supply structure allows to make an important conclusion about contemporary farm economy in the specific social, institutional, market and natural environment of the country. Firstly, it indicates that the amount of highly specific for the farm human capital (permanently and to some extend part-time employed persons) and opportunities for intra-farm division and/or cooperation of labor (permanently, part-time and seasonally employed persons) for exploration of technological economies of scale and/scope within the farm boundaries are relatively small. It also demonstrate well-known fact from the economics textbooks and widespread international practices that unlike other industries the farm type (family, small member partnerships) and farm enterprise size (borders) are determined and extension restricted by the high transaction costs for coordination, direction, stimulation, monitoring, and controlling opportunism, of coalition members and non-family hired labor [27]. Besides, when markets for resources, inputs and service supply developed, and contract negotiation and enforcement improved (transaction costs for external supplies diminished), then the maximum extension of farm operations (exploration of existing technological economies of scale and scope) become practically possible.

Second, current farms structure of labor supply demonstrates the importance of farms as income source for rural and (part of) urban population at present stage of development. Bulgarian farms are a major but not a significant source for providing income of (rural and urban) population. Farms' relative contribution to permanent income is not great being important only for one third of the total workforce in the sector. Nevertheless, the absolute contribution of farms to rural

economy is considerable having in mind the great number of holdings in the country. On the other hand, farms' relative contribution to partial and seasonal income of (rural and urban) population is superior - a bigger number of employed persons per farm, the greater total number of seasonally employed workforce. However, but absolute contribution of part-time and seasonal employment is less significant – only supplementary and/or short-period (seasonal) income generation.

Type of Labor, Employment Contract, and in Farm Utilization

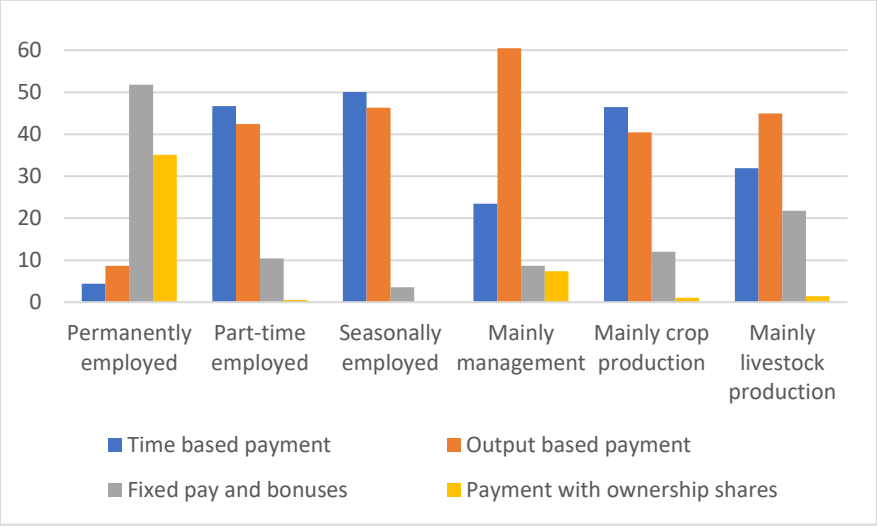
Personality of the farm workers and the type of work remuneration are important characteristics of the labor supply governance. Almost all farms employ permanently the owners of the farm and a significant proportion of them (43%) family members. Similarly, quite a good part of all farms employ part-time the farm owners and their family members – 24% and 12% accordingly. Moreover, a big fraction of farms employ seasonally the owners (12%) and family members (22%). Consequently, the owners of the farms comprises a large share of the total workforce in the sector (37,2%) including a quarter of permanently employed, 5,4% of part-time employed, and 6,2% of seasonally employed persons by farms. Similarly, the family members account for 28% of the total workforce employed by farms, including 15,4% of permanently employed, 7,2% of part-time employed, and 5,3% of seasonally employed persons in farming. All these is quite understandable since the main goal of most farm enterprise is to be a major source of employment and income of the owner and household members.

Another major reason for this is that owner(s) and his (their) family members has the best interests and motivation for effective investment in farm specific capital (time and efforts for education, professional training, searching for information, and innovation, adaption the enterprise needs and goals, etc.), for cooperation, restricting opportunism and dispute resolution (in case of coalition), and increasing the overall productivity, efficiency and sustainability ("own the residual rights"). Therefore, transaction costs for this type of (critical for the farm) labor supply are zero (one person holding) or very low (family farm or partnership). Commonly no formal (written) agreement (contract) are used while intra-farm relations are effectively governed by trust, self-motivation, information sharing, constant cooperation and adaptation, self-restriction of opportunism, and "internal" dispute resolution.

What is more, mostly the same people are employed as permanent, part-time and seasonal workers - by two-third of farms for permanent labor, almost each third for part-time labor and more than a half for seasonal labor. The frequent employment of the same person(s) minimize significantly transaction costs of relations between parties. It let develop farm specific knowledge, personal acquaintances, ties and friendship, improve on-job training, motivate cooperation, and (self)restrict opportunism (which will be easily punished by not repeating/renewing transactions between same parties), and eventually facilitate and dimmish overall costs of labor supply.

In addition, different payment methods are designed for effective stimulation of (family and hired) labor toward increasing farm efficiency, sharing the (natural, market, managerial, etc.) risks, and minimize labor supply and utilization costs (Figure 6). Remuneration of the majority of permanent workers is either with shares in property, typical for the owners and family members (35%), or mixed with fixed salary plus bonus according to farm performances, applied for owners, family members and hired labor (52%). On the other hand, the payment of the part-time and seasonal labor is predominately time-based, when individual contribution to final output is difficult to measure, or highly uncertain due to other natural, economic, behavioral etc. factors – for 47% and 50% of employed accordingly. Output-based remuneration of part-time and seasonal workers is widely used when individual performance is easily verified (e.g. performing standards operations, harvesting yields, etc.) – for 42,4% and 46,3% of workers respectively. In the latter case, the (output-based payment) labor employment contract is quite similar (not different) from service supply contract for performing certain farm operations and/or tasks.

Figure 6: Payment Modes for Different Types of Employed Labor in Bulgarian Farms (Percent)



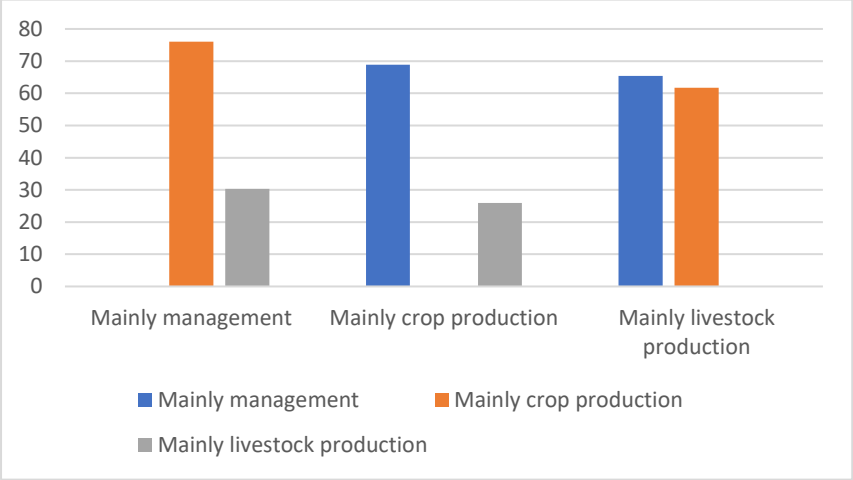
Source: interviews with farm managers

There are significant differences in the labor supply for the specific type of farming activities. A little more than half of the holdings employ labor predominantly engaged in farm management activities, 56% of them use employed labor mainly in crop production activities, while 23,5% mostly in livestock production activities. The number of employed persons in major activities of farms vary considerably being the smallest for employed predominately in farm management (0,46), average for employed mainly in livestock production (0.85) and highest for these employed mostly in crop production sector (1,98). Less than 5% of total workforce in country's farms are predominately employed in farm management, 22% are specialized in crop production activities, and 4% are engaged mainly in livestock production. All these figures give some insights on intra-farm division of labor in Bulgarian holdings, the type of employment to supply labor for major areas of farm's

activities, and the relative contribution of major agricultural sectors in the overall farm employment and economy.

Intra-farm division between management and production activities is developed in a big number of holdings. It is particularly advanced in farms in crop production where 76% of holdings employing labor for predominantly management functions are also employing labor mostly specialized in crop production activities (Figure 7). The same proportion for farms in livestock production activities of just above 30%. At the same time, holdings with specializing labor both in crops and livestock productions report a high share of employment predominately engaged in farm management – 68,9% and 65,4% accordingly.

Figure 7: Share of Farms with Specialized Labor in Diverse Activities in Bulgaria (Percent)



Source: interviews with farm managers

Intersectoral division of labor is also developed in a good number of farms. The latter is particularly advanced in holdings with labor specialized in livestock production where 61,7% of farms simultaneously are employing labor predominately involved in crop production activities. In 25,9% of holdings with specialized labor in crop production there is also employed labor engaged in livestock production activities.

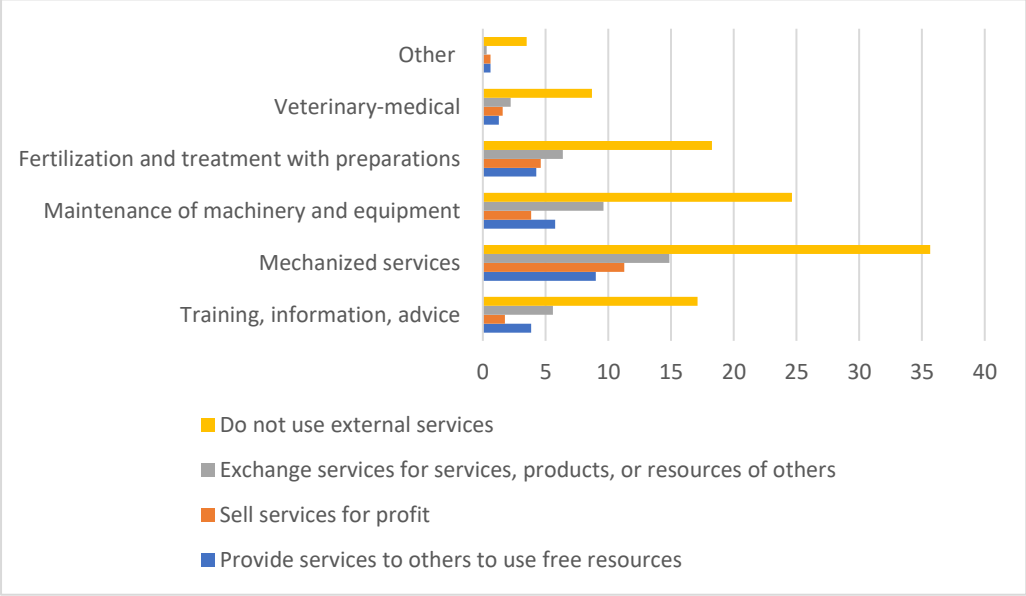
The kind of labor and payment modes also differ depending on sectors of farm activities. For predominately crop production activities of holdings almost 32% of farms use owners' and 17,4% of them family members labor. On the other hand, in predominately livestock production activities only 11,3% of farms employ owners labor and a little bit less than 5% family members' labor. Almost all farms employ mostly the same persons for specialized farm management and livestock production activities. Simultaneously, turnover in mostly crop production activities is higher and frequent employment of the same people much lower – 63%.

The most widespread mode of payment for employed persons in farm management is output based (60,5%), followed by time-based remuneration (23,4%), fix payment combined with bonuses (8,6%), and with shares in property (7,4%). Most labor in predominately crop production employment is paid on time base (46,5%), a significant portion (40,5%) gets output-based payment, and around 12% have mixed fix payment complemented by bonuses. The most popular mode of payment for labor employed in livestock production is output-based (44,9%), followed by time-based compensation (31,9%) and mixed payment of fix wages and bonuses (21,7%). Labor compensation with shares in property is used for a small share (1%) of employed specializing in crop and livestock activities.

Extent of Labor Integration

Alternative governance mode for intra-farm employment of labor is outside supply of needed (labor) services through some form of service contract or (collective, public, etc.) organization. A significant portion of Bulgarian farms do not use outside suppliers for major services – e.g. 35,6% for mechanization services, 24,6% for maintenance of machineries and equipment, 18,3% for fertilization and application of chemicals, 17,1% for training, information and advice, 8,7% for veterinary and medical services, and 3,5% for other important services (Figure 8). In some cases, the reason for the latter is lack of necessities due to the specificity or scale of production – e.g. primitive, small scale and subsistence farming, organic certification, etc.

Figure 8: Share of Farms Not Using External Services and Providing Major Agricultural Services to Other Agents for Different Reasons in Bulgaria (Percent)



Source: interviews with farm managers

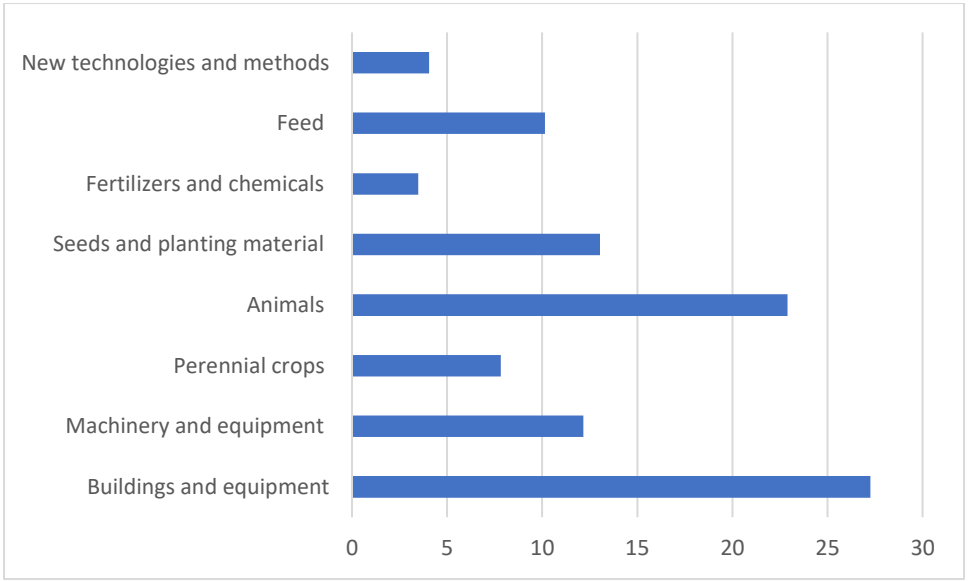
However, the principal reason for the "internal supply" of major services is that they are performed by the farm manager/owners or there is a (permanent, part-time and/or seasonally) family and/or

hired labor to execute these important for the farm activities. For many farms integration of specialized services (employing labor and other resources) is more efficient mode comparing to external supply of services. It is usually caused by the needs to invest in highly specific for the farm critical activities – high direct and/or transaction costs to find outside (market) supplier in terms of quantity, quality and/or timing [27]. At the same time, "diversification" into needed for farm "new" activity is easy (learning by doing experiences) while outside trade of temporary available own or hired labor is costly or impossible (high transaction costs to sell out the farm' free labor or services).

What is more, certain fraction of farms also provide (sell) specialized services to other farms (particularly widespread for mechanization services) in order to use free (labor and material) resources, to make profit, or exchange against other services, products, or resources. For these farms, selling out services is more efficient mode than the internal use of "services" (of labor and other related resources) and selling farm produce, interlinking against other services, etc.

Another alternative for the intra-farm employment of labor is outside inputs supply ("make or buy decision"). A good proportion of Bulgarian farms do not use outside procurement of needed inputs since they supply them internally as a specialized or complementary activity of employed farm labor. For instance, 27,2% of holding report they produce needed buildings and equipment, 22,9% of them they produce needed animals, 13% integrate production of needed seeds and planting materials, 12,2% produce needed machinery and equipment, 10,1% produced needed feed, 7,8% produce needed perennial crops, 4% create new technologies and methods, and 3,4% produce needed fertilizers and chemicals (Figure 9).

Figure 9: Share of Farms Not Using External Inputs Supply in Bulgaria (Percent)



Source: interviews with farm managers

Inputs supply is organized internally since it is possible to explore existing economies of scale and/or scope withing a particular farm - large scale operation, existing own or hire labor and know how, etc. However, another major reason for the internal supply (own production) of necessary inputs is the comparative efficiency of that mode - the greater transaction costs for external supply due to lack of any or reliable supplier, high interdependency with farm's major activity (e.g. feeds for farm livestock, seeds for crop production), and strategy to safeguard (own production of minimum or optimum supply) against likely risk of outside procurement related to market price stability, quality, authenticity, time of delivery, etc.

Modes of Labor Supply in Different Type of Farms

Labor supply modes are quite different in farms of divers juridical types (Table 1). Permanent employment is the major form for all type of farms which is applied to the biggest extent in cooperatives (100%) and corporations (98,2%), and to a great portion by physical persons (97%) and sole traders (94,9%). Owners of the farm are used as labor for this type of employment in all type of holdings. At the same time, the share of farms employing permanently family labor is the biggest for sole traders (59,5%) and much smaller for the cooperative farms (13,3%) and corporations (29,6%) where more hired labor is employed.

Table 1: Share of Farms of Different Kinds and Locations Applying Different Type of Employment in Bulgaria (Percent)

	Physical Persons	Sole traders	Cooperatives	Corporations	Mostly for self-sufficiency	Small size	Midle size	Bif size	Field crops	Vegetables, flowers and	Permanent crops	Grazing livestock	igs, poultry and rabbits	Mixed crops	Mixed livestock	Crop and livestock	Bees	Plain regions	Mountain regions	Protected zones	Near big cities
Permanently employed	97.00	94.87	100.00	98.18	100.00	99.36	95.77	100.00	93.48	96.15	100.00	94.12	100.00	95.83	100.00	100.00	94.64	97.27	98.04	93.55	95.56
Farm owners	98.67	100.00	100.00	100.00	100.00	98.71	99.26	100.00	100.00	98.00	100.00	96.88	100.00	97.83	100.00	100.00	100.00	100.00	97.00	100.00	97.67
Family members	46.90	59.46	13.33	29.63	42.86	45.81	47.79	25.93	32.56	50.00	37.50	50.00	37.50	36.96	42.86	60.61	49.06	39.72	53.00	37.93	30.23
Part-time employed	45.92	38.46	53.33	50.91	42.86	42.31	51.41	40.74	45.65	48.08	48.21	41.18	62.50	45.83	85.71	48.48	37.50	47.27	43.14	58.06	33.33
Farm owners	5.61	13.33	50.00	17.86	100.00	6.06	10.96	36.36	14.29	8.00	7.41	14.29	0.00	13.64	16.67	31.25	4.76	11.54	9.09	22.22	13.33
Family members	62.62	40.00	12.50	28.57	0.00	69.70	41.10	9.09	33.33	72.00	66.67	42.86	40.00	31.82	50.00	18.75	76.19	55.77	45.45	50.00	60.00
Seasonally employed	51.50	56.41	86.67	67.27	28.57	58.97	52.82	77.78	60.87	65.38	68.75	29.41	25.00	70.83	42.86	60.61	33.93	57.73	52.94	64.52	75.56
Farm owners	5.00	9.09	30.77	10.81	0.00	2.17	13.33	19.05	7.14	0.00	3.90	0.00	100.00	14.71	0.00	15.00	15.79	6.30	11.11	10.00	8.82
Family members	28.33	13.64	0.00	2.70	50.00	27.17	14.67	9.52	0.00	20.59	27.27	20.00	0.00	14.71	33.33	25.00	21.05	20.47	24.07	35.00	44.12
Mainly in management	50.64	43.59	40.00	60.00	0.00	52.56	51.41	48.15	56.52	57.69	62.50	44.12	37.50	50.00	57.14	48.48	37.50	49.55	53.92	48.39	66.67
Farm owners	93.22	58.82	83.33	66.67	0.00	90.24	79.45	84.62	76.92	96.67	91.43	80.00	66.67	79.17	100.00	62.50	76.19	80.73	94.55	93.33	86.67
Family members	7.63	29.41	33.33	24.24	0.00	6.10	20.55	23.08	19.23	10.00	5.71	0.00	33.33	29.17	0.00	31.25	9.52	16.51	9.09	13.33	16.67
Mainly in crop production	59.23	53.85	40.00	49.09	42.86	64.10	51.41	44.44	45.65	65.38	77.68	38.24	25.00	62.50	57.14	66.67	26.79	50.45	62.75	58.06	73.33
Farm owners	90.58	71.43	66.67	77.78	66.67	89.00	83.56	83.33	76.19	97.06	89.66	61.54	0.00	93.33	75.00	68.18	80.00	84.68	89.06	94.44	87.88
Family members	69.57	23.81	0.00	29.63	100.00	67.00	49.32	25.00	33.33	88.24	62.07	30.77	50.00	46.67	25.00	36.36	40.00	49.55	71.88	61.11	75.76
Mainly in livestock production	21.03	30.77	33.33	25.45	57.14	19.87	26.06	18.52	15.22	3.85	8.04	64.71	37.50	10.42	85.71	78.79	41.07	20.45	29.41	22.58	11.11
Farm owners	93.88	50.00	60.00	42.86	100.00	90.32	70.27	20.00	57.14	100.00	77.78	90.91	66.67	40.00	50.00	69.23	86.96	80.00	83.33	100.00	60.00
Family members	61.22	58.33	0.00	7.14	75.00	58.06	43.24	20.00	14.29	0.00	22.22	50.00	33.33	20.00	50.00	50.00	52.17	42.22	56.67	42.86	40.00

Source: interviews with farm managers

Part time employment is practiced mostly by cooperatives and corporations among which accordingly 53,3% and 50,9% use that mode of labor supply. A half of the cooperatives employ part time owners while in other type of holdings the part time employment of owners is less typical. Nevertheless, employing family labor though this mode is used by 62,6% of physical persons and 40% of sole traders, and by a much smaller share of other type of farms being lowest in cooperatives (12,5%).

Seasonal employment is incorporated to the greatest extent by cooperatives (86,7%) and by much smaller proportions of other juridical types (67,3% of corporations, 56,4% of sole traders, and 51,5% of physical persons). Farm owners and family members are employed seasonably only by a good share of cooperatives (30,8% for owners) and physical persons (28,3% for family members), and by smaller fractions by other juridical types. The latter share is the lowest in physical persons and sole traders for the owners' labor (5% and 9,1% accordingly), and in cooperatives and corporations for the family members' labor (0 and 2,7% respectively).

Division of labor between different functions and productions is unequally developed in individual juridical types. A bigger portion of corporations (60%) employs labor predominately in management relative to other farming types being lowest in cooperatives (40%). At the same time, physical persons has the biggest share of holdings (59,2%) employing labor predominately in crop productions, while cooperatives in employing labor predominantly for livestock production (33,3%).

There are also differences in employment modes depending on size of farms. Permanent employment is applied by smaller share of holding with middle sizes (95,8%), while part time employment is practices by the largest share of that farms size (51,4%). On the other hand, seasonable employment is applied by the greatest proportion of big farms (77,8%). Furthermore, the bigger proportion among small size farms employs labor predominately in crop productions (64,1%) comparing to bigger scale holdings. At the same time, the greatest fraction of holding mostly for subsistence employes predominately labor in livestock production (57,1%). Family members are employed to the biggest extent by smaller size holdings.

There is also diversion in type of employment according to the product specialization of farms. The share of farms with permanent employment is the smaller among holding specialized in field crops (93,5%), grazing livestock (94,1%) and bees families (94,6%). The proportion of farms employing part time labor is the biggest in mix livestock holdings (85,7%) and smallest in those with bee families (37,5%) and grazing livestock (41,2%). On the other hand, seasonable employment is mostly used by mix crops farms (70,8%) and less popular among holdings specialized in pigs, poultry and rabbits (25%), and bee families (33,9%).

The number of farms employing family members permanently is the biggest among mix crop-livestock holdings (60,6%) and smallest among those specialized in field crops (32,6%). The portion of farms employing owners part time is the biggest in mix crop-livestock farms (31,2%) and smallest in holdings in pigs, poultry and rabbits (0%) and in bees keeping (4,8%). Simultaneously, most bees keeping farms employ family members part time (76,2%) along with holdings in vegetables, flowers and mushrooms (72%), and permanent crops (66,7%). The smallest share of farms employing family labor part time is in mix crop-livestock (18,7%), and field crops (one third). All farms in in pigs, poultry and rabbits, and none in mix livestock, grazing

livestock, and vegetables, flowers and mushrooms employs owners seasonally. Every third farms in mix livestock employ family members seasonally, and none among those in pigs, poultry and rabbits, and field crops.
The greatest proportion of farms with specialized labor employed predominantly is crop productions is among holdings in permanent crops (77,7%), mix crop-livestock (two third), and vegetables, flowers and mushrooms (65,4%). On the other hand, labor predominately employed in livestock productions is in farms mix livestock (85,7%) and gazing livestock (64,7%).

There is also variation in employment modes in farms located in different regions of the country. Relatively smaller number of farms in protected zones employs permanently labor (93,5%) comparing to other locations. Part time employment is the most widespread among farms in protected zones (58,1%) and least important for holding located close to big cities (each third one). Seasonable employment is practiced by the greatest share of farms located close to big cities (75,6%) and smallest proportion of holding in mountainous regions of the country (52,9%). Family members are employed permanently by the biggest number of farms in montunoes regions (53%) and the smallest extent by holdings around big cities (30,2%). Owners are employed part time by the biggest portions of farms in protected zones (22,2%), and smallest one in holdings in mountainous regions (9,1%). On the other hand, family members is used as labor by the biggest share of farms located in proximity to big cities (60%) and least by those in mountainous parts of the country (45,4%). Owners are employed seasonally less in farms in plain regions (6,3%) and around big cities (8,8%) comparing to farms in other regions (maximum of 11,1% in mountainous regions). At the same time, seasonal family labor is most important for farms around big cities (44,1%) and least applied in plain regions (20,5%).

More farms in protected zones employes owners predominately in crops productions (94,4%) than in other regions (smallest share of 84,7% in plain regions), while specialized in crops operations family labor is more used in farms around cig cities (75,8%) and mountainous regions (71,9%) and least applied in plain regions (49,5%). On the other hand, specialized owner's labor in livestock productions is used by all farms in protected zones and it is least applied in farms around big cities. Simultaneously, specialized in livestock production family labor is the most widespread in farms in mountainous regions (56,7%) and less important among farms close to bis cities (40%).

Different type of farms have unlike needs of various type of labor and contribute differently to the overall agricultural employment. The corporations are with the biggest average number of employed persons permanently, part-time and seasonally – 17,27, 7,13 and 10,46 accordingly (Table 2). On the other hand, physical persons are with the smallest number of permanently employed (0,4) and seasonally employed (2,65) labor. The smallest number of part time employed labor is in sole traders.

Table 2: Average Number of Employed Persons in Farms of Different Type and Locations in Bulgaria

	Physical Persons	Sole traders	Cooperatives	Corporations	Mostly for self-sufficiency	Small size	Midle size	Bif size	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	igs, poultry and rabbits	Mixed crops	Mixed livestock	Crop and livestock	Bees	Plain regions	Mountain regions	Protected zones	Near big cities
Permanently employed	0.40	1.14	17.27	3.63	0.14	0.24	2.32	8.44	5.84	0.32	0.38	2.94	6.38	1.78	2.86	6.27	0.55	1.71	1.20	4.28	2.33
Part-time employed	1.59	1.07	7.13	4.71	0.67	1.39	2.18	11.00	3.29	2.44	1.26	2.00	5.40	3.50	4.17	3.25	0.71	2.57	2.27	2.67	1.20
Seasonally employed	2.65	3.64	10.46	6.46	0.50	2.63	3.89	10.71	7.43	3.41	4.04	3.10	1.50	2.56	9.00	2.60	1.37	4.61	3.11	4.45	2.62
Mainly management	0.32	0.94	0.17	0.79	0.00	0.22	0.52	1.69	0.62	0.80	0.20	0.53	0.67	0.79	1.25	0.56	0.33	0.49	0.44	2.73	0.10
Mainly crop production	1.99	0.14	1.50	3.44	0.00	1.74	2.22	3.58	3.00	2.59	2.14	0.92	0.00	1.00	3.00	1.05	1.80	1.77	2.48	5.06	1.58
Mainly livestock production	0.69	0.58	1.20	1.57	0.00	0.74	0.89	2.40	1.29	0.00	0.67	0.91	0.00	0.00	3.67	1.15	0.43	0.71	1.00	4.86	1.00

Source: interviews with farm managers

The average number of employed predominately in management is in sole traders (0,94) and smallest one in cooperatives (0,17). The highest number of specialized persons both in crops and livestock productions are in corporations (3,44 and 1,57 accordingly) and the lowest in sole traders (0,14 and 0,58 accordingly).

The average number of permanently, part-time and seasonally employed persons in big farms is accordingly 4,8 times, 4,6 times and 2,7 times higher than the average one for the country. At the same time, the labor in holdings predominantly for subsistence is a small fraction of the average for the sector – 8% for permanently employed, 28% for part time employed, and almost 13% for seasonally employed persons.

The number of employed persons of all types by the farms specialized in fields crops, and mix livestock is much higher than the average for the country. In pigs, poultry and rabbits, and mix crops farms that number is superior only form permanently and part time employed labor, in mix crops only for permanent labor, in vegetables, flowers and mushrooms only for part time labor, and in permanent crops only for seasonal labor. On the other hand, in bee keeping the employed person in all categories is below the average sectoral figures.

Farms located in protected zones employe bigger than country's average number of labors permanently, part time and seasonally. Farms close to big cities employe permanently higher number than the average one, while in plain regions the number of part time and seasonally employed persons in above the average for the sector. In mountainous regions the average employment of all type of labor is inferior than the sectoral.

Major types of employment have different importance for different type of farms comprising various parts of the total workforce of enterprise. For instance, the amount of the permanent labor ranges from 15,57% of the workforce in physical persons up to 57,3% in cooperatives; the number of part time labor accounts between 11.59% of the total employment in sole traders up to 29.41% of the physical persons, and the seasonal labor varies between 30,09% in cooperatives up to 57.97% of the workforce of sole traders (Table 3).

Table 3: Share of Persons with Different Type of Employment in Total Workforce of Bulgarian Farms (Percent)

	Physical Persons	Sole traders	Cooperatives	Corporations	Mostly for self-sufficiency	Small size	Midle size	Bif size	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	igs, poultry and rabbits	Mixed crops	Mixed livestock	Crop and livestock	Bees	Plain regions	Mountain regions	Protected zones	Near big cities
Permanently employed	15.57	30.43	57.30	34.57	57.69	9.97	41.20	39.72	47.54	8.29	10.19	61.44	62.96	33.33	27.78	66.56	41.43	30.05	30.93	47.51	48.31
Owners of farm	40.66	34.06	13.05	17.99	26.92	44.74	25.81	11.15	13.64	26.42	33.65	24.18	18.52	21.95	9.72	21.54	108.57	24.14	27.58	13.03	31.88
Family members	33.39	26.09	1.11	5.82	26.92	31.81	16.43	2.79	5.49	24.35	18.72	16.99	11.11	11.38	8.33	13.18	58.57	11.90	27.84	7.66	8.70
Mostly same persons	13.32	7.97	30.97	27.69	0.00	8.36	19.04	36.06	33.71	10.88	6.87	7.84	41.98	8.54	8.33	36.33	17.14	21.18	30.41	0.77	2.42
Time based payment	2.08	2.17	0.22	1.76	0.00	2.70	0.91	1.57	1.89	2.59	1.18	3.27	0.00	0.41	0.00	0.96	5.71	1.31	2.58	1.53	0.97
Output based payment	6.75	0.72	0.00	1.94	3.85	1.08	5.22	1.05	2.46	1.55	4.74	1.31	7.41	2.85	0.00	0.96	12.86	3.37	2.58	0.00	0.00
Fixed pay and bonuses	4.67	21.01	21.68	26.46	0.00	3.77	13.17	32.93	29.17	1.55	2.37	17.65	46.91	2.03	1.39	30.23	8.57	16.58	22.94	0.77	4.35
Payment with ownership shares	2.08	6.52	35.40	4.41	0.00	2.43	21.90	4.18	14.02	2.59	1.90	39.22	8.64	28.05	0.00	34.41	14.29	8.78	2.84	23.75	43.00
Part-time employed	29.41	11.59	12.61	23.28	23.08	24.80	20.73	21.08	13.07	31.61	16.11	18.30	33.33	31.30	34.72	16.72	21.43	21.92	25.77	18.39	8.70
Owners of farm	1.56	7.25	5.97	8.47	0.00	1.35	5.61	7.32	6.63	1.04	3.08	11.11	0.00	15.04	1.39	6.75	1.43	6.65	1.03	7.28	5.31
Family members	17.47	6.52	0.22	2.65	15.38	19.68	5.87	0.35	2.08	16.06	13.27	5.88	2.47	4.07	6.94	1.61	32.86	7.39	7.73	4.98	6.28
Mostly same persons	12.63	7.25	3.76	3.53	0.00	7.55	10.43	1.39	2.08	10.36	5.21	6.54	22.22	7.72	13.89	7.40	11.43	3.45	18.81	2.30	0.97
Time based payment	12.11	5.07	9.07	10.05	7.69	11.59	6.26	14.11	7.95	10.88	5.21	7.84	4.94	15.04	5.56	10.29	10.00	11.25	8.76	1.53	0.00
Output based payment	13.49	1.45	3.54	11.11	0.00	8.89	11.60	6.45	3.60	19.69	6.64	9.15	23.46	15.04	0.00	5.79	4.29	7.55	16.49	0.38	6.76
Fixed pay and bonuses	3.81	4.35	0.00	1.94	0.00	4.31	2.74	0.35	1.14	1.04	4.27	1.31	4.94	1.22	6.94	0.32	7.14	2.96	0.52	1.92	1.93
Payment with ownership shares	0.00	0.72	0.00	0.18	0.00	0.00	0.13	0.17	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.16	0.00	0.00	0.00
Seasonally employed	55.02	57.97	30.09	42.15	19.23	65.23	38.07	39.20	39.39	60.10	73.70	20.26	3.70	35.37	37.50	16.72	37.14	48.03	43.30	34.10	43.00
Owners of farm	1.90	5.80	8.85	8.47	0.00	0.54	7.95	7.67	5.68	0.00	6.40	0.00	11.11	10.98	0.00	6.43	4.29	5.17	2.32	2.68	19.81
Family members	13.67	4.35	0.00	0.35	11.54	15.63	3.26	0.87	0.00	7.77	12.09	3.27	0.00	4.47	2.78	3.22	12.86	5.09	7.47	5.75	18.84
Mostly same persons	21.45	34.78	16.37	26.28	3.85	28.30	19.82	21.60	19.51	19.69	27.73	15.69	0.00	39.02	6.94	13.83	37.14	24.79	16.75	11.11	26.57
Time based payment	28.55	21.01	21.90	16.75	0.00	31.00	14.73	25.26	27.46	38.86	21.33	3.27	3.70	19.11	20.83	10.61	10.00	23.23	25.52	11.11	9.18
Output based payment	22.49	34.06	8.19	25.22	3.85	30.46	21.64	13.94	11.17	20.21	49.29	15.69	0.00	14.23	6.94	4.82	25.71	22.50	17.78	2.68	31.88
Fixed pay and bonuses	3.98	2.90	0.00	0.18	0.00	3.77	1.69	0.00	0.76	1.04	3.08	1.31	0.00	2.03	0.00	1.29	1.43	2.30	0.00	0.77	1.93
Payment with ownership shares	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: interviews with farm managers

The share of permanently employed persons in total workforce in respective farms is the higher for predominately subsistence holdings (57,69%) and middle size farms (41,2%). The later share is the smallest for small size farms (around 10%) which have the biggest proportions of seasonal (65,23%) and part time (24,8%) labor. At the same time, middle size farms are characterized with smallest shar of part time labor (20,73%) while mostly subsistence holdings (19,23%) with the smallest share of seasonal labor in total employment.

Permanently employed comprise for the biggest portion of the workforce of crop-livestock farms (66,56%) and the smallest one in farms specialized in vegetables, flowers and mushrooms (8,29%). At the same time, part time employed consists between 13.07% (field crops) and one third (pigs, poultry and rabbits) of the workforce of Bulgarian farms. The seasonal labor accounts for the biggest portion of the total workforce in farms in vegetables, flowers and mushrooms (60,15) and the smallest one in holdings specialized in pigs, poultry and rabbits (3,7%).

The permanently employed comprise the greatest proportions of the workforce in farms located around big cities (48,31%) and in protected zones (47,51%). On the other hand, the seasonal labor accounts for the largest fraction of the workforce in the farms in other regions of the country. Farms located in proximities to big cities are characterized with the smallest fraction of part time labor (8,7%) in their total workforce.

Type of labor and modes of payments in the total workforce also differ according to the type of farming enterprise. Owners and family members comprise the biggest share of permanently employed labor in physical persons (74%), sole traders (60%), farms with small size (77%), and holding specialized in bee keeping (100%), permanent crops (52.37%), and vegetables, flowers and mushrooms (50,77%). On the other hand, hired labor comprise a major part in the total workforce of cooperatives, corporations, farms with big size, and holdings specialized in field crops, grazing livestock, and mixed productions.

A good portion of farms report hiring the same persons every time. Fix payment with bonuses depending on the overall performance for permanent labor is widely applied by farms of juridical type, size, and specialization. In addition, 35,4% of cooperative labor's remuneration is with shares in property. On the other hand, different type of payments (time-based, output-based or hybrid) of hired labor is widely used according to the specificity of work.

Different type of farms contribute to a various extent towards the overall employment in the sector. The cooperatives share in the overall permanent employment in agriculture is the biggest - 44,12% of total permanently employed labor in the country (Table 4). At the same time, sole traders accounts for the smallest share (7,16%) of the permanently employed labor in the sector. On the other hand, physical persons are responsible for the majority of the permanently employed owners (52,69%) and family members (72,01%) in agriculture.

Table 4: Share of Employed Labor in Farms of Different Type and Locations in Total Permanent, Part-Time and Seasonal Workforce in Bulgaria (Percent)

	Physical Persons	Sole traders	Cooperatives	Corporations	Mostly for self-sufficiency	Small size	Midle size	Bif size	Field crops	Vegetables, flowers and mushrooms	Permanent crops	Grazing livestock	igs, poultry and rabbits	Mixed crops	Mixed livestock	Crop and livestock	Bees	Plain regions	Mountain regions	Protected zones	Near big cities
Permanently employed	15.33	7.16	44.12	33.39	2.56	6.30	53.83	38.84	42.76	2.73	7.33	16.01	8.69	13.97	3.41	35.26	4.94	62.35	20.44	21.12	17.04
Part-time employed	45.33	4.27	15.20	35.20	1.60	24.53	42.40	32.27	18.40	16.27	18.13	7.47	7.20	20.53	6.67	13.87	4.00	71.20	26.67	12.80	4.80
Seasonally employed	40.93	10.30	17.50	30.76	0.64	31.15	37.58	28.96	26.77	14.93	40.03	3.99	0.39	11.20	3.47	6.69	3.35	75.29	21.62	11.45	11.45

Source: interviews with farm managers

Physical persons also contributes to the greatest portion of the total part time employed labor in the sector (45,33%) while sole traders employ merely 4,27% of the total amount of this type of labor. The majority of the totally employed part time and seasonally owners in the country is done by the corporations (51,06% and 44,86% accordingly). On the other hand, the best part of the all part-time and seasonally employed family members (80,16% and 84.95% respectively) are in the farms of physical persons.

The biggest contributor to the overall employment in the country are middle size farms accounting for 53,83% of the total permanent, 42,4% of the total part time, and 37,58% of total seasonal

labor employed in the country. The second biggest contributor to the permanent and part time employment are large farms (38,84% and 32,27% of the total), and for the seasonal labor - the small farms (31,15%). At the same time, the contribution of predominately subsistence holdings to the overall employment in Bulgarian agriculture is insignificant.

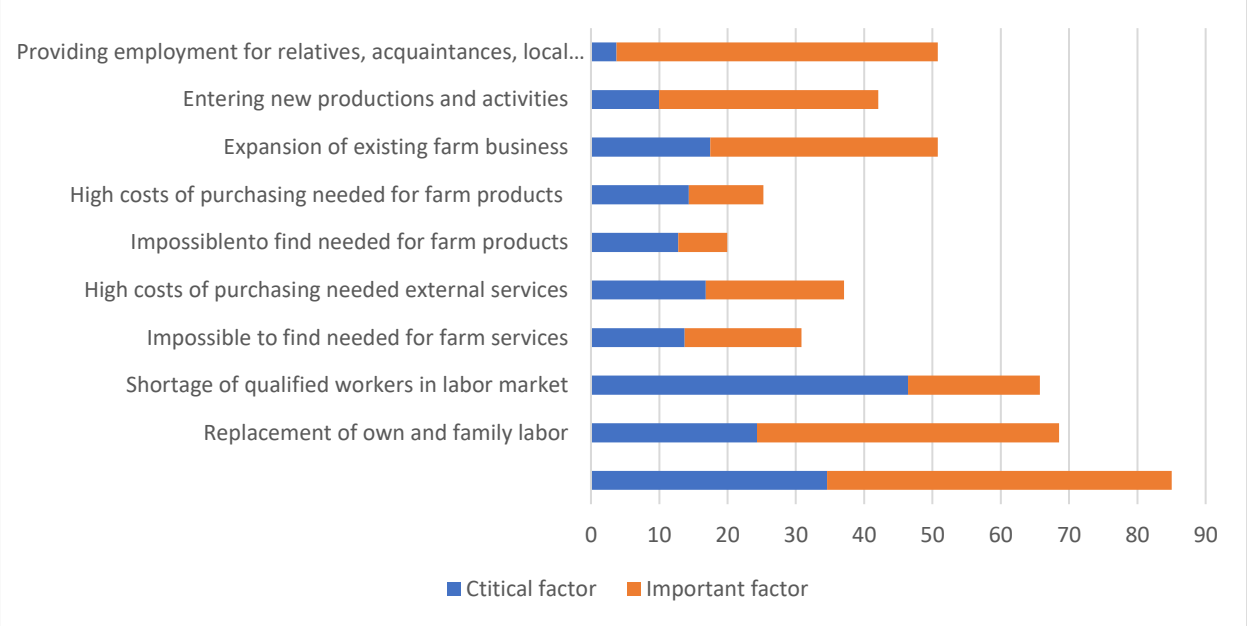
Farms specialized in field crops employ the considerable portion of total permanently employed labor in agriculture – 42,76%. The biggest contributor for part-time employment in the sector are farms specialized in mix crops – 20,53% of the total workforce. On the other hand, the majority to all seasonally employed labor in the country is by holdings specialized in permanent crops (40,03%).

The greatest number of all type of employment is done by the farms located in plain regions of the country.

Factors and Evolution of Labor Supply Governance During EU Integration

There are diverse critical or important factors for hiring of labor by Bulgarian farms at current stage of development. Supplementing own and family labor is reported as a critical or important factor for hiring labor by 85,05% of surveyed farms, while replacement of the own and family labor is a key factor for 68,54% of them (Figure 10). Another major reason for using employment contract for 65.73% of farms is the lack of qualified workers in the labor market.

Figure 10: **Main Reasons for Hiring Labor by Bulgarian Farms (Percent)**



Source: interviews with farm managers

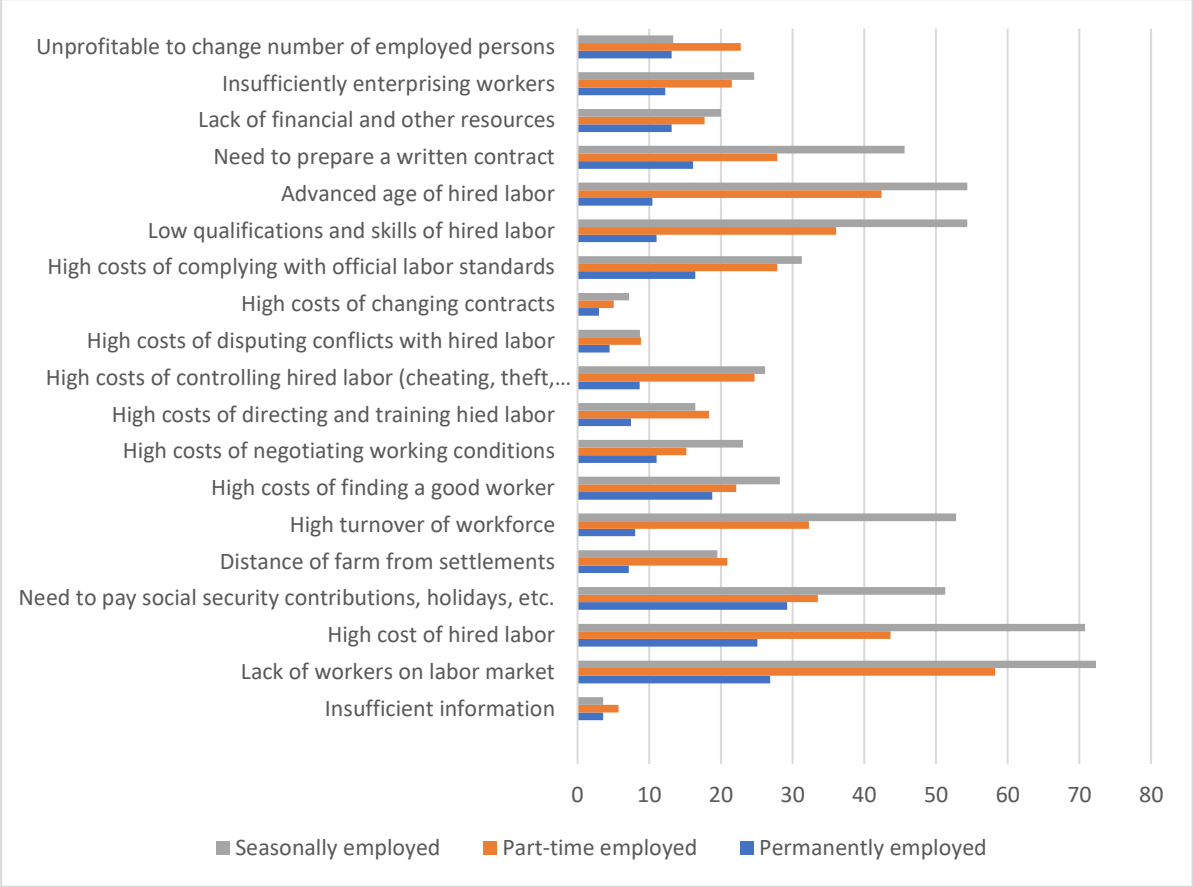
For over half (50,78%) of the employing external labor farms the major reason for hiring labor is extension of existing business of the farm as well as providing employment of relatives, friends and local population. For a considerable proportion of farms (42,06%) entering into new productions and activities is a critical or important factors for hiring labor.

A good portion of farms use internal organization (hiring labor and other resources and in-farm production) as more efficient (in terms of transaction and production costs saving) form to the external supply of needed for farm products and/or services. For instance, 30,84% of the employing outside labor farms report that it is impossible to find needed for farm services, and 37,7% of them that there are high costs for purchasing needed external services. Moreover, for a quarter of hiring farms there are high costs for purchasing needed for farm products, and for every fifth one it is impossible to find needed for farm products.

Only a small part of the surveyed farms report having no important problems hiring labor while the considerable part of them specify existing problems, including almost 70% in hiring permanent labor, 21% in hiring part time labor, and 36,4% in hiring seasonable labor.

The most important problems in hiring labor for the greatest majority of Bulgarian farm are the lack of (particularly high for seasonal and part-time) labor in the labor market, the high price of hired labor, requirement to pay social payments, pay-holidays, etc., big turnover of (particularly for part time and seasonal) workers, high costs for adapting official labor standards (particularly for part time and seasonal labor), high costs for controlling of hired labor (cheating, stealing, etc.) (particularly for part time and seasonal labor), high costs for negotiating conditions of employment (particularly for seasonal labor), high costs to find good (particularly part time and seasonal) workers, low qualification of hired (particularly part time and seasonal) labor, advance age of hired (particularly part time and seasonal) labor, requirement for signing a written contract (particularly part time and seasonal workers), and insufficient initiatives of (particularly part time and seasonal) workers (Figure 11). Some farms also indicate that it not profitable to change the number of employed in their farm – around 23% for part time labor, and by 13% for permanent and for seasonal labor).

Figure 11: Problems Hiring Different Types of Labor in Bulgarian Farm (Percent)



Source: interviews with farm managers

At the same time, for a great majority of labor hiring farms certain important parts of contracts related costs (e.g. disputing conflicts, changing negotiated terms, etc.) are not issues.

For a significant number of Bulgarian farms, the amount of costs for finding needed labor (45,8%), and the amount of costs for managing the hired labor and workers in the farm (41,45%) are factors strongly restricting development of their enterprise. The latter is particular important for a good proportion of major commercial farms reaching 53,33% and 46,67% for cooperatives, 47,21% and 42,49% for physical persons, 45,45% and 43,64% for corporations, a relatively smaller number of sole traders – 35,9% and 28,21% accordingly.

In addition to the difficulties related to an effective labor supply, other personal, social, economic, institutional, etc. factors are important for the overall development of Bulgarian farms. The critical factors (and transaction costs) strongly restricting development of many farms at present stage

are: legislation and regulation environment in the country and sector, the amount of costs for finding needed lands and natural resources, amount of costs for finding needed short-term and long-term assets, amount of costs for finding needed finance for the farms, amount of costs for finding needed innovations, amount of costs for marketing of output, amount of costs for registration, certification, etc., existence of informal and gray sector in agriculture, and socio-economic situation in the region and in the country.

Comparison with similar studies in the beginning of the century (using identical methodology, questionnaires, etc.) (Bachev and Tsuji, 2000) gives a real possibility to assess the fundamental evolution of labor supply governance in Bulgarian agriculture during the last two and a half decades [21].

The major forms of labor supply in farms changed enormously during the period of pre-accession and EU membership (Table 5). In the beginning of the century, there were a huge number of a small-scale farms, including enormous "semi-market" and subsistence sector, mostly operating with limited family labor and (lands, orchards, vineyards, buildings, equipment, finance, etc.) resources. Private property rights on lands and other resources, services, waters, etc. were not completely defined, restored (e.g. land rights in real borders), disputed and properly enforced. Self employment, family and coalition (cooperative) member employments were the dominant mode of labor supply. Employing non family labor (hiring) were mostly applied to extend established business and to a smaller extend to replace own or family labor (e.g. specialization in management, non farm diversification, retirement, etc.). Permanent employment of non-family labor were rarely hired while "cheaply available" short -term (daily, seasonal) or part time forms widely practiced.

Table 5. Evolution of labor supply governance in Bulgarian farms

Characteristics	Pre-accession period (2000-2022)	Present (2023-2025)
Farming structures	Numerous, unregistered, many new comers, non-professional farming, primitive technologies, low efficiency and sustainability, small scale, owned and family (land, labor, savings) resources, old organizations under liquidation, pyritization and transformation, old management style, high subsistence to generate and/or supplement income, strategy for survival, widespread part-time farming, dualistic (very small multiproduct – very big highly specialized), no strict intra0farm specialization of labor, many external owners of corporate and cooperative assets (lands, shares in	Decreased number of farms, more formally registered farms (legal entities, agricultural producers), smaller importance of unregistered and cooperative farms, efficient farms with different sizes, highly specialized, modern management style, diverse type of coalition (based of skills, know how, capital, etc.), established, highly efficient and competitive, high entry and exit costs (regulations, registrations, investments, etc.), intensive external market and private (lands, labor, finance, innovation) supply of resources, inputs and services, diverse type of coalitions, strategy for long-term development, integrated with developed inter-farm division of labor (management, crop, livestock, services), professional farmers and labors, modern technologies, mechanization and digitalization, few owners

	property) with no involvement in management, low entry and exit costs, small-scale (subsistent, semi-market and market) holdings and cooperatives major employer in agriculture, rural area and nationally	of corporate and cooperative assets with direct management, middle size and big farms major employers
Labor personality and quality	Own and family labor, relatives and friends, locals, experienced in old public farms, less educated, untrained, not certified, inexperienced in farming, unemployed from other businesses, in pre-retirement or retirement age, high turnover of labor, farming as favorite free time occupation, lack of public income support	Own and family labor, unknown agents, from other regions and/countries, usually the same persons, educated, well-trained, skilled, experienced in modern farming, advanced age of many farmers and labors, many young farmers and labor, requirement for special training certification or licensing, strong relations with universities and training centers, established reputation, new comers from other sectors, farming as free time occupation, farming as lifestyle
Labor markets and costs	Undeveloped or missing resources, products and service markets, informal, unregulated, lack of adequate control and support infrastructure, primitive and personalize exchanges, insufficient and asymmetric information, high labor supply, low wages and salaries, no additional costs (insurance, medical holiday, pension, unemployment, etc. payments)	Well-developed resources, labor, service, and products markets, competitive, modernized infrastructure, open to EU, strictly regulated (minimum wages, labor safety and working conditions, benefits, etc.), and better enforced, CAP income support, intensive faceless exchanges, specialized mediating agents, reduced market information asymmetry, high direct and indirect labor supply (average wages and salaries, mandatory social etc. payments, taxation), labor supply as alternative to services or products supply, insufficient supply of cheap labor, shortage of skilled labor
Modes of labor supply and payments	Self-employment, labor manages cooperatives and firms, permanent and part time employment, daily or short-term hiring, small-scale informal partnerships, no incentives for long-term farm specific investment, hiring to extend business, no negotiations and written contract, simple remuneration (daily fix wages, or output based), no social payments, no bonuses, untaxed, delayed, lower, or not payment of salaries and wages, compensation with farm produce	Self-employment, permanent employment for skilled workers, small scale formal partnerships, strong incentive for farm specific investments, hiring to keep business or replace family labor, outside (non-agrarian, foreign) entrepreneurs with capital, know how, etc. investment, integration of supply chains, mix payments including bonuses and shares in output and business, multiple mandatory and specific benefits (training, accommodation, pay holidays, etc.), labor union and professional association (to negotiate prices, conditions, etc.), improved labor conditions more attractive for young and educated farmers and workers
Form of contract and disputes	Informal, oral, general, standard ("classical"), privately enforced, disputes do not arise or privately resolved	Written and unwritten, most registered and legally enforced, publicly regulated (form, terms, period, registration, social payment and taxation), tailored to needs of agents (special, "neoclassical"), cash payments, governed by trust and reputation, supported and enforced by a third (private or public) parties, many disputes often resolved by authority or court
Institutional environment	In the process of harmonization with EU, high (institutional, market, behavioral) uncertainty, dynamic and (often) controversial changes, outdated and badly enforced labor safety and working	Modernized according to EU, huge CAP public support (subsidies for modernization, employment, training, young farmers, semi-market farms, associations, rural development, etc.), improved enforcement and punishment of offenders, public system of farmers and workers training

	standards, lack of sufficient public support, high corruption	and advise, mandatory labor employment and safety standards (minimum and overtime payments, working hours, holidays, social benefits, protection from firing, in case of farm bankruptcy, etc.), access to legal consultation and support
Transaction costs and factors for farm development	Low transaction costs for labor supply and management, very high transaction costs in general, most critical factors - high costs for contract enforcement, credit supply and marketing of produce	High transaction costs for labor supply and management, critical factors - legislation and regulation environment, high costs for inputs and finance supply, marketing, registration and certification, existence of informal sector, socio-economic situation

Source: author

Polarized farming structure prevailed consisting of the most efficient for the specific conditions miniature subsistence and semi-market holdings, and small member partnerships in one end, and enormous cooperatives and firms (renting lands from hundreds and thousands of landowners and hiring numerous local workers) at the other extreme. Outdate management style and organizations were widespread (path dependencies, majority of managers and labor coming from old public farms, no public training and information, etc.), multifunctional use of labor were dominating, and no internal division of labor (specialization in managerial and technological functions) practiced. There were hundreds of thousands of unprofessional and part-time farm entrepreneurs, farmers and laborers (old of age, unemployed, low income, subsistent holdings) with no farming experience or training, no willingness to stay in farming (unregular employment), and no significant (financial, human, innovation, etc.) investment in farm modernization.

Primitive technologies and manual works were dominating in agriculture, with few farms introducing complex mechanizations, and modern scientific, information, communication and digitalization achievements. Relations with universities and research establishment were rare and no initiatives undertaken to improve education and research according to farmers' needs, and facilitate innovations and labor recruitments. The public system for farmers and workers training and advice was in the beginning of formation and largely inaccessible by majority of agents. There were no advanced system for labor selection (references, certificates, etc.), and stimulation of workers initiatives, training and motivation (long-term and permanent employment contract, bonuses, free training, compensation with shares in output or property, etc.). Extensive negotiations and contracting to adapt to mutual needs were rare while fix and daily wage (cash and other) payments widely used as remuneration for hired labor (high inflation, low income, shortage of goods, no enforcement system). Consequently, large scale cheating (stealing time and resources), not cooperating with information sharing, efficiency improvement, strategy development and implementation by employed workers were typical.

Most labor and other markets were undeveloped and dynamic, while governing structures highly unsustainable (part-time farming, multiple reorganizations, failures, bankruptcies, mergers, take-

overs, temporary organizations under privatization, short term contracts, cash and carry deals, etc.). There appeared many new agents with no history, established reputation and/or strategy to stay in agriculture. Market, institutional and behavioral uncertainty were enormous increasing costs and deterring potentially mutually exchanges between entrepreneurs, resource (including labor) owners, food-chain actors, and final consumers. Delay, lower, not payments of salaries and wages, compensation with farm produce, etc. were widespread in farming, rural and related sectors.

The public system for law and contract enforcements was not efficient, and informal private (inwritten, unregistered, illegitimate) modes were widespread to govern resource supply and safeguard transactions – unwritten employment contracts, daily, part-time and/or seasonal hiring of labor, interlinked modes (e.g. labor supply against food, feed, services and resources supply), barters deals, personalized (instead of faceless market) exchanges, private enforcements modes, illegitimate use of labor and other resources, etc. Disputing labor rights was difficult (unawareness of rights, weak power position, no effective third part arbitration and protection), primitive (over insufficient, delay or no payments), and usually resolved in private way (firing labor, quitting job, using informal enforcements, personal ties, revenge punishment, etc.).

Modern labor safety, (minimum) payment, social (working hours, holidays, medical and pension contribution, unemployment support) etc. standards were under not established, in a process of development (public discussion, dynamic changes, unknown by affected and implementing agents), and inadequately enforced by authority (personal relations, high corruption, significant power of and dependencies from local entrepreneurs, etc.). There were no strict regulations on labor rights for employment, use, benefits (unemployment, compensation in case of firing, bankruptcies of farm) in general and in agriculture in particular (labor rights, use of child, minorities, disables, immigrants, etc. labor). There were no labor unions and effective professional organizations to promote, represent and protect farmers and labor rights.

Direct public income and other support were very low and inaccessible to majority of farmers. Public and private system to support and facilitate relations between employers and labor were emerging (advertise jobs, connect parties, promote and fund interim, on job training, etc.) and inefficient. Professional and other organizations for sharing managerial and farming experiences, information and innovations, etc. were with limited membership, inefficient and unsustainable.

Unemployment rate were high, wage level low, demands for unskilled or low sill workers not significant. Long-term and written labor contracts were rare and related social payments and protection (labor quality and safety standards, social benefits, unemployment payments, etc.) practically missing. Besides, little external (EU, labor union, NGOs, international organizations, etc.) support, control and enforcement were available. There was no labor shortage due to the big labor supply in general and for farming in particular – widespread family subsistence and small scale

farming, high unemployment, crises and transformation of other sectors, low demand for unskilled and untrained workers of old public farms and companies, many active workers in pre-retired and retired age, etc.

Transaction (information, implementation, enforcement, learning by doing/mistakes, etc.) costs associated with external labor supply (and other farm transactions) were very high due to rapid modernization of institutional environment (introduction and enforcement of EU laws and regulations, multiple changes and amendments), markets liberalization and adjustments, inadequate market and support infrastructure, low efficiency of the system for enforcement of private contracts, restructuring of farming structures and production, little managerial experience of farmers, primitive technologies and organizations, insufficient public support (training, advice, subsidies), monopoly positions of state or private agents, widespread corruption, etc. Furthermore, the effective optimization of farm size was severely restricted by the high enforcement costs of contracts in general, and enormous credit supply and marketing costs.

Conclusion

There has been enormous development in labor supply governance in Bulgarian farms during the last two decades. The interdisciplinary New Institutional Economics framework give new insights on agents, modes, process, order, efficiency and progress of the labor and overall governance in agrarian sphere. It has to be periodically used in economic analysis to support public decision making and farm management. However, the wider application of this new framework requires collection of new type of (micro) economic data and significant changes in the official (agro) statistical system in the country and EU.

This study based on new representative micro-economic data has found that permanent employment is a major form for labor supply in Bulgarian farms, flowed by the seasonal and the part-time employments. Owners and family members accounts for the largest share of the total workforce of farms. Different forms like high recurrence of contract between with the same person, output-based compensation, use of service supply or inputs contracts, etc. are use to reduce transaction costs of labor and overall governance of farms. The reasons for using employment contracts and importance of different labor supply and governance modes, intensity of transactions, types of partners, and kinds of remuneration varies considerably depending on juridical type, size, specialization, and locations of holdings.

For majority of farms the most important problems in hiring labor are the lack of labor in the labor market, the high price of hired labor, requirement to pay social payments, pay-holidays, etc., big turnover of workers, high costs for adapting official labor standards, high costs for controlling of hired labor (cheating, stealing, etc.), high costs for negotiating conditions of employment, high

costs to find good workers, low qualification of hired labor, advance age of hired labor, requirement for signing a written contract, and insufficient initiatives of workers.

For a significant number of Bulgarian farms, the amount of costs for finding needed labor, and the amount of costs for managing the hired labor and workers in the farm are factors strongly restricting development of their enterprise. The latter is particular important for a good proportion of major commercial farms like cooperatives, physical persons, and corporations, a to a lesser extent to sole traders. Other critical factors strongly restricting development of Bulgarian farms at present stage of development are: legislation and regulation environment in the country and sector, the amount of costs for finding needed lands and natural resources, amount of costs for finding needed short-term and long-term assets, amount of costs for finding needed finance for the farms, amount of costs for finding needed innovations, amount of costs for marketing of output, amount of costs for registration, certification, etc., existence of informal and gray sector in agriculture, and socio-economic situation in the region and in the country [33-36].

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Foot Note

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2. employment contract role here is to overcome "hold up problem" - partie(s) who anticipate the opportunistic behavior does not invest or underinvest in firm specific capital and therefore existing potential to increase productivity is not realized.
3. in terms of transaction and production costs and benefits.
4. However, cases of illegal slavery are still reported in some countries or certain sectors around the globe.
5. For the supply of other agrarian resources there are transaction costs before their procurement and production costs during their exploitation. At the same time, the external labor supply in farming is often associated with significant transaction costs during effective use of hired labor.
6. transaction costs have behavioral origins - bounded rationality and tendency for opportunism of agents (Williamson, 2005).
7. They cause variation of transaction costs among principal governing modes (Williamson, 2005).
8. In fact, the manager optimizes not the individual (e.g. labor or land supply) transactions but the governance of entire farm – all activities and transactions of the enterprise.
9. The detailed presentation of statistical tests and results is done by Bachev and Ivanov (2025).